

CLAIMS

1. A method for recording a bar code comprising a
5 plurality of base elements, said method using a sequence
of images from an image sensor, which together reproduce
the bar code, images in the sequence being partially
overlapping, said method comprising
- 10 a) generating base element position information
regarding borders of base elements in the images
by analysing the images in the sequence, and
 - b) reconstructing the bar code by using the contents
of the various images and the base element posi-
tion information.
- 15 2. A method as claimed in claim 1, in which step a)
comprises the following steps
- detecting edges in an image,
 - detecting directions of extension of the edges in
the image, and
 - 20 rotating the image, so that the directions of exten-
sion of the edges correspond to the direction of exten-
sion of rows or columns of pixels in the image.
3. A method as claimed in claim 2, in which the
detection of the directions of extension of the edges
25 is performed using a Hough transform.
4. A method as claimed in claim 1, in which in step
a) one-dimensional data is created and frequency analysed
for each image, said one-dimensional data describing the
existence of intensity changes along a predetermined
30 direction in the image.
5. A method as claimed in claim 4, in which said
one-dimensional data for each image comprises a row tran-
sition vector, in which the elements have values which
are representative of the amounts of intensity changes
35 along a plurality of columns in the image, and a column
transition vector, in which the elements have values

which are representative of the amounts of intensity changes along a plurality of rows in the image.

6. A method as claimed in claim 1 or 4, in which step a) comprises the following steps

5 thresholding pixels in the image, so that the pixels assume one of two binary values,

generating a row transition vector, in which each element has a value which is representative of the number of transitions, in a plurality of columns in the image,
10 from one binary value to the other between two adjoining rows,

generating a column transition vector, in which each element has a value which is representative of the number of transitions, in a plurality of rows in the image, from
15 one binary value to the other between two adjoining columns, and

frequency analysing the row transition vector and the column transition vector.

7. A method as claimed in claims 4 or 5, in which
20 the frequency analysis is performed using an FFT algorithm.

8. A method as claimed in claim 1, in which in step b) the base element information, which concerns the values of the base elements, for each image is extracted
25 based on the image and the base element position information, and the bar code is reconstructed based on the base element information.

9. A method as claimed in claim 8, in which the base element position information is a grid which defines the
30 borders of the base elements in the image, and is applied to the image, in which method the value of each base elements is determined based on the pixels in the image which are defined by the grid as belonging to this base element.

35 10. A method as claimed in claim 9, wherein the algorithm that determines the value of the base element is configured in such a manner that pixels at a great

distance from the borders of a base element have greater weight than pixels close to the borders.

11. A method as claimed in claim 88, in which the base element information for each base element has less
5 information contents than the corresponding part of the original image.

12. A method as claimed in claim 11, in which the base element information of each base element is represented by a bit.

10 13. A method as claimed in claim 1, in which the bar code is a two-dimensional bar code.

14. A method as claimed in claim 13, in which the bar code is a type PDF417 bar code.

15 15. A method as claimed in claim 1, in which the base element position information for an image in the sequence is produced by determining, from the content of the image, a grid which indicates the borders of the base elements in the image.

16. A method as claimed in claim 15, further
20 comprising creating a binary base element representation of the image by representing each base element in the image with a single binary value.

17. A method as claimed in claim 16, in which the bar code is reconstructed by correlating binary base
25 element representations created from the images in the sequence.

18. A system for recording a bar code comprising a plurality of base elements, which system uses a sequence of images which together reproduce the bar code, images
30 in the sequence being partially overlapping, which system comprises means for generating base element position information regarding borders of base elements in the images by analysing the images in the sequence, and means for reconstructing the bar code by using the
35 contents of the various images and the base element position information.

19. A system as claimed in claim 18, in which the bar code is a type PDF417 bar code, and the vertical extension of the images is such as to allow them to cover the full height of the bar code.

- 5 20. A computer program for recording a bar code comprising a plurality of base elements, a sequence of images from an image sensor being used, which together reproduce the bar code, images in the sequence being partially overlapping, which computer program comprises
- 10 instructions corresponding to the steps
- a) that borders of base elements in the images is generated by analysing the images in the sequence, and
 - b) that the bar code is reconstructed by using the
- 15 contents of the various images and the base element position information.

21. A digital storage medium comprising a computer program according to claim 20.